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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/647,615

08/25/2003

Josef Fazekas

PEK-IN1137

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08/18/2004

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EXAMINER

HU, SHOUXIANG

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 08/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/647,615

Applicant(s)

FAZEKAS ET AL.

Examiner

Shouxiang Hu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>08/26/03</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. Claims 1-14 are objected to because of the following informalities and informalities, including but not limited to:

In claims 1 and 14, the term of "impressing" should read as: --applying--.

In claims 1 and 14, the term of "connected" should read as: --being connected--.

In claims 1 and 14, the term of "detecting" should read as: --for detecting--.

In claims 1 and 14, the term of "at least partially" should read as: --and at least partially--.

Thorough proofreading and appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8 and 12-14, as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 102(b) as being anticipated by Saito (JP 2000174085 A; 6/23/2000; of record).

Saito discloses an electromigration test structure for detecting reliability of wirings (Figs. 1-5, especially Fig. 4; also see the English abstract), comprising: first and second test structure terminal regions (4A and 4B) for applying a heating current; a region to be tested having an electromigration region (1; metallic) with a naturally substantially constant material flow and an electromigration barrier region (a contact, the interconnection region between region 1 and region 3A) with a naturally reduced material flow, wherein the region to be tested is connected between the first and second structure terminal regions, the electromigration region can thus naturally produce a substantially homogeneous temperature distribution therein; first and second sensor terminals (6A and 6B) coupled to and for detecting a failure of the region to be tested; and, a third sensor terminal (8A) that can naturally be used to detect a temperature of the electromigration region as it is connected to the electromigration region in direct proximity to the electromigration barrier region, wherein the third sensor terminal formed in direct proximity to the electromigration barrier region is at least partially parallel to the first test structure terminal region (at the overlapping region between the 3A and 1; or at the vertically portion 7A, which is parallel to the vertical edges of region 4A) and has smaller interconnect width than the electromigration region.

Regarding claim 6, with the first sensor terminal as being configured in Fig. 4, a temperature equalization with respect to the electromigration region can naturally take place.

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Regarding claim 8, with the electromigration barrier region as being configured in Fig. 4, a respective temperature gradient of at most a predetermined value naturally exists when a temperature is reached.

Regarding claim 12, the electromigration test structure in Saito is for testing the reliability of semiconductor device. It thus naturally has a semiconductor circuit containing the testing structure.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 9-11, as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito in view of Chesire et al. ("Chesire"; US 5264,377).

The disclosure of Saito is discussed as applied to claims 1-8 and 12-14 above.

Saito does not expressly disclose that the test structure can further include a dummy structure. However, one of ordinary skill in the art would readily recognize that such a dummy structure can be desirably included for better performance for the testing structure, as evidenced in Chesire (see the parallel dummy structure 106 and or 107 in Fig. 1), wherein the dummy structure is

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spaced apart from the region to be tested with a substantially minimum structure width.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the dummy structure of Chesire into the testing structure of Saito, so that a testing structure with better performance would be obtained.

Regarding claim 10, Saito further teaches to form the connection between a terminal portion (3A) and the electromigration region (1) through a contact region that can naturally function as an electromigration barrier region. It would be well within the ordinary skill in the art to also form the dummy connection between the dummy terminal portion and the dummy electromigration region in the above collectively taught structure through a similar contact region as the one in Saito, so that a test structure including the dummy testing structure would be obtained with a simplified process.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References B-F are cited as being related to an electromigration testing structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is

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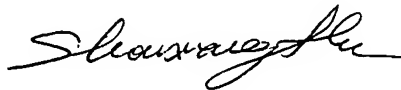
571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH

August 16, 2004



SHOUXIANG HU
PRIMARY EXAMINER